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A SMALL PORTABLE MIST BLOWER FOR APPLYING CONCENTRATED SPRAY

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A small, portable mist blower has been developed by the writers for applying concentrated sprays. Features of the application are high insecticidal concentration of the spray mixture, fine atomization, low gallonage per acre, and the use of air as the carrier instead of water, thus enabling tiny, foglike mist droplets to be carried for long distances. The machine will apply any insecticides, fungicides, hormones, or combinations as solutions, emulsions, or suspensions. It is light and flexible and can be regulated for applying 1/2 to 6 gallons of mixture per acre with a pressure of 4 to 8 pounds per square inch. The tops of 30- to 40-foot trees can be reached, and the spray can be drifted horizontally for 200 feet or more.

A skid model (fig. 1) weighs 88 pounds with the tank full of spray. It can be placed in the back of a light truck or carried on a cart, small tractor, or wheelbarrow. It consists essentially of a small tank of 1 to 3 gallons capacity, a strainer in the spray pipe line, an abrasive-resistant pump weighing 3 to 4 pounds, a liquid bypass attached to the pump, a pressure gage, a needle valve for regulating spray delivery, a quickly operated shut-off valve, an atomizing nozzle, an aluminum pressure blower such as Allen Billmyre Model 10HR12, and a 1- to 2-hp. gasoline engine, such as the 1.3-hp. Lauson engine (model R.S.C.). The blower on the units shown in figures 1 and 2 weighs 15 pounds. It delivers 120 cubic feet of air per minute at 240 m.p.h. through a 1 $\frac{1}{4}$ -inch diameter nozzle outlet attached to a 3-foot flexible 2 $\frac{1}{4}$ -inch i.d. auto hose. The best operating speed for the blower is 6,000 to 10,000 r.p.m. Gear pumps are satisfactory for applying solutions and emulsions, but suspensions must be pumped with a centrifugal pump or a plunger pump.

The wheelbarrow chassis (fig. 2) has a 14- by 20-inch metal base to which the spray rig is bolted. It is constructed mostly of 1/8- by 1 $\frac{1}{4}$ -inch angle iron. The chassis would be lightened

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considerably if made of magnesium or aluminum. A kick stand is provided to prevent it from overturning when standing on a steep slope. For use on a wheelbarrow, a quick shut-off valve and a lever for waving the air discharge hose back and forth could be attached to the handle.

Two kinds of nozzles have been used--(1) a direct-pressure type requiring 40 to 60 pounds' pressure, and (2) a capillary-tube nozzle with four 1/16- or 3/16-inch i.d. hollow brass tubes projecting from the periphery of a circular feed pipe for a distance of 1/4 inch into the mouth of the outlet. The brass tubes are sharpened at their free ends to increase the shearing action of the air blast that passes over them at right angles.

At 240 m.p.h. drop spectra with mass average diameters of approximately 40, 45, and 50 microns, respectively, are obtained when solutions, emulsions, and suspensions of spray material are applied. Reducing the diameter of the air outlet increases the air velocity but slightly reduces the air volume. Usually 6 to 15 gallons of spray liquid are applied per hour, averaging 10 gallons. Less volume can be applied by reducing the pressure or by using a smaller nozzle orifice or plugging one or more of the nozzle openings.

Potential uses for the machine include the treatment of ornamentals and gardens on large estates; groups of small gardens; nurseries; greenhouses; coniferous plantations; marshes; bogs; grapes; peanuts; small truck-crop areas; clover fields; corn (when cart-mounted above the plants); young orchard trees; barns; barnyards; pens; livestock; junk piles, lumber yards, and stone quarries for gypsy moth control on quarantined material; and limited application for gypsy moth control along streets and in parks and woodland areas.

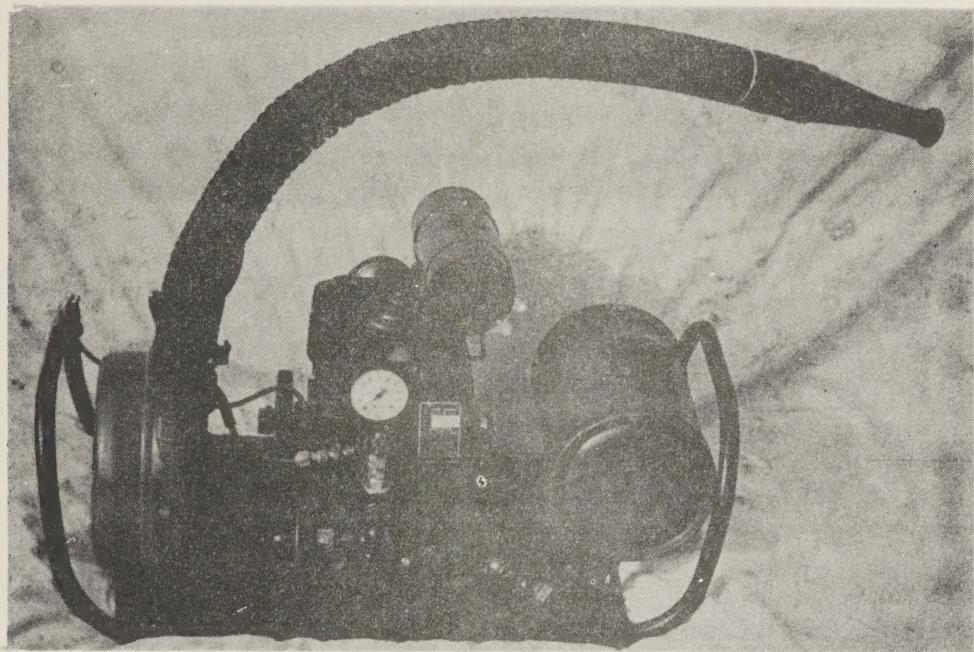


Figure 1.--Skid-model mist blower for mounting on a cart, small tractor, truck, or wheelbarrow.

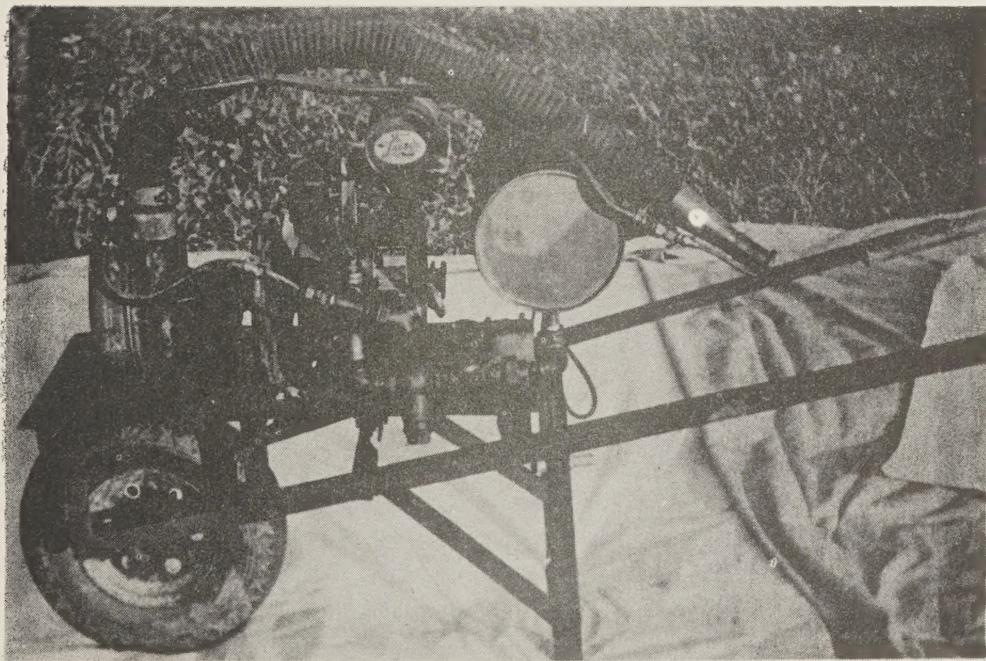


Figure 2.--Small mist blower mounted on a wheelbarrow chassis.

